

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-41

Name: Lake Lakota

County: Lincoln

Legal Description: T97N-R48W-Sec. 19

Location from nearest town: 1 mile south, 3-1/2 miles west of Fairview, SD

Dates of present survey: June 4, 2008 (all species electrofishing)

Date last surveyed: May 31, 2006 (all species electrofishing)

Primary Game Species	Other Species
Largemouth Bass	Black Crappie
Bluegill	Black Bullhead
Yellow Perch	White Crappie

PHYSICAL DATA

Surface Area: 100 acres

Watershed area: 25,462 acres

Maximum depth: 25 feet

Mean depth: 12 feet

Volume: No data

Shoreline length: No data

Contour map available: Yes

Date mapped: Unknown

OHWM elevation: None set

Date set: NA

Outlet elevation: None set

Date set: NA

Lake elevation observed during the survey: Full

Beneficial use classifications: (4) warmwater permanent fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Introduction

Lake Lakota was originally named Pattee Creek Watershed Structure P-1 because of it's location in the Pattee Creek Watershed Project. The lake provides excellent fishing when full but a leak in the basin frequently causes the lake to go dry. The lake was not surveyed from 1999 to 2004 due to low water.

Ownership of Lake and Adjacent Lakeshore Properties

Lake Lakota and the surrounding land are owned and managed by the South Dakota Department of Game, Fish and Parks. Land management is split between the Parks and the Wildlife Divisions.

Field Observations of Water Quality and Aquatic Vegetation

Sago pondweed (*Potamogeton pectinatus*), floating leaf pondweed (*Potamogeton natans*) and coontail (*Ceratophyllum demersum*) covered approximately 75 percent of the surface area of the lake this year. The water was very clear with a Secchi depth measurement of 0.91 m (36 in) and no floating algae was observed.

BIOLOGICAL DATA

Methods:

The fish population was sampled by nighttime electrofishing for 1.7 hours on June 4, 2008. Electrofishing is used because dense stands of submergent vegetation make sampling with frame nets ineffective.

Results and Discussion:

Electrofishing Catch

Bluegill was the most abundant species (54.6%) sampled followed by yellow perch, largemouth bass, black bullhead, and black crappie (Table 1).

Table 1. Total catch of 1.67 hours of electrofishing at Lake Lakota, Lincoln County, June 4, 2008.

Species	#	%	CPUE	80% C. I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Bluegill	407	54.6	244.2	<u>+28.5</u>	35.2	51	1	128
Yellow Perch	109	14.6	65.4	<u>+3.2</u>	25.1	0	0	99
Largemouth Bass	108	14.5	64.8	<u>+2.5</u>	135.4	87	80	101
Black Bullhead	96	12.9	57.6	<u>+4.8</u>	45.6	100	100	97
Black Crappie	25	3.4	15.0	<u>+4.6</u>	17.4	5	5	109

* Three years (1999, 2004, 2006)

Largemouth Bass

Management objective: Maintain a largemouth bass fishery with an electrofishing CPUE of at least 20.

Largemouth bass electrofishing CPUE was 64.8 with a PSD of 78 (Table 1) and 75 bass longer than 38 cm (15 in) were captured. Growth rates were above average for South Dakota waters (Table 3) and multiple year classes were present with age-4 to age-7 fish most abundant (Table 3 and Figure 1).

Table 2. Largemouth bass electrofishing CPUE, PSD, RSD-P, and mean Wr for Lake Lakota, Lincoln County, 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Mean*
CPUE					312.6		88.2		64.8	200.4
PSD					59		78		87	69
RSD-P					0		28		80	14
Mean Wr					100		104		101	102

* 2 years (2004, 2006)

Table 3. Average back-calculated lengths, in mm, for each age class of largemouth bass from Lake Lakota, Lincoln County, June 4, 2008.

Year Class	Age	N	Back-calculation Age							
			1	2	3	4	5	6	7	8
2007	1	6	119							
2006	2	12	84	213						
2005	3	4	83	158	276					
2004	4	12	96	173	306	369				
2003	5	20	117	200	308	370	408			
2002	6	21	117	210	281	366	410	434		
2001	7	19	115	190	266	341	393	425	447	
2000	8	5	105	183	280	345	382	415	442	453
1999	9	1	94	194	249	326	352	392	436	447
All Classes		100	103	190	281	353	389	417	442	450
Statewide Mean			96	182	250	305	342			
Region III Mean			111	212	287	347	383			
SLI* Mean			99	183	246	299	332			

*Small Lakes and Impoundments (<150 acres)

Bluegill

Management objective: Maintain a bluegill fishery with an electrofishing CPUE of at least 50 and RSD-18 of at least 20.

Young bluegills were very abundant in Lake Lakota this year (Table 1). Most of the bluegills sampled were two years old, indicating inconsistent natural reproduction (Table 5). Growth to age-2 was faster than the regional, statewide, and small impoundments means (Table 3).

Table 4. Bluegill electrofishing CPUE, PSD, RSD-P, and mean Wr for Lake Lakota, Lincoln County, 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Mean*
CPUE					5.4		70.8		244.2	38.1
PSD					89		81		51	85
RSD-18					56		61		1	59
RSD-P					44		6		1	25
Mean Wr					118		129		128	124

* 2 years (2004, 2006)

Table 5. Average back-calculated lengths (mm) for each age class of bluegills in Lake Lakota, Lincoln County, 2008.

Year Class	Age	N	Back-calculation Age							
			1	2	3	4	5	6	7	8
2006	2	63	46	141						
2005	3	1	54	143	161					
2002	6	1	38	91	138	153	172	199		
All Classes			46	141	150	153	172	199		
Statewide Mean			55	103	141	166				
Region III Mean			60	116	157	180				
SLI* Mean			53	101	138	163				

*Small Lakes and Impoundments (<150 acres)

All Species

Black bullhead numbers have remained relatively constant over the past 10 years (Table 6). The population is currently comprised of large fish (Table 1) that could provide some angling opportunity. Small yellow perch were common (Table 1).

Table 6. Electrofishing CPUE for all fish species sampled in Lake Lakota, Lincoln County, 1999-2008.

Species	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
BLB	47.3					51.0		38.4		57.6
CCF	6.7					--		--		--
BLG	29.5					5.4		70.8		244.2
LMB	5.3					312.6		88.2		64.8
WHC	--					2.4		3.6		--
BLC	--					49.8		2.4		15.0
YEP	38.7					28.2		8.4		65.4
WAE	6.0					--		--		--

BLB (Black Bullhead), CCF (Channel Catfish), BLG (Bluegill), LMB (Largemouth Bass), WHC (White Crappie), BLC (Black Crappie), YEP (Yellow Perch), WAE (Walleye)

MANAGEMENT RECOMMENDATIONS

1. Continue to monitor Lakota with an all-species electrofishing survey every other year.

Table 4. Stocking record for Lake Lakota, Lincoln County, 1996-2008.

Year	Number	Species	Size
1996	1,716	Yellow Perch	Adult
2001	10,000	Largemouth Bass	Fingerling
	5,965	Rainbow Trout	Catchable
	18,700	Rainbow Trout	Fingerling
	1,056	Yellow Perch	Adult
2003	10,070	Largemouth Bass	Fingerling
2004	980	Bluegill	Adult
	9,500	Largemouth Bass	Fingerling

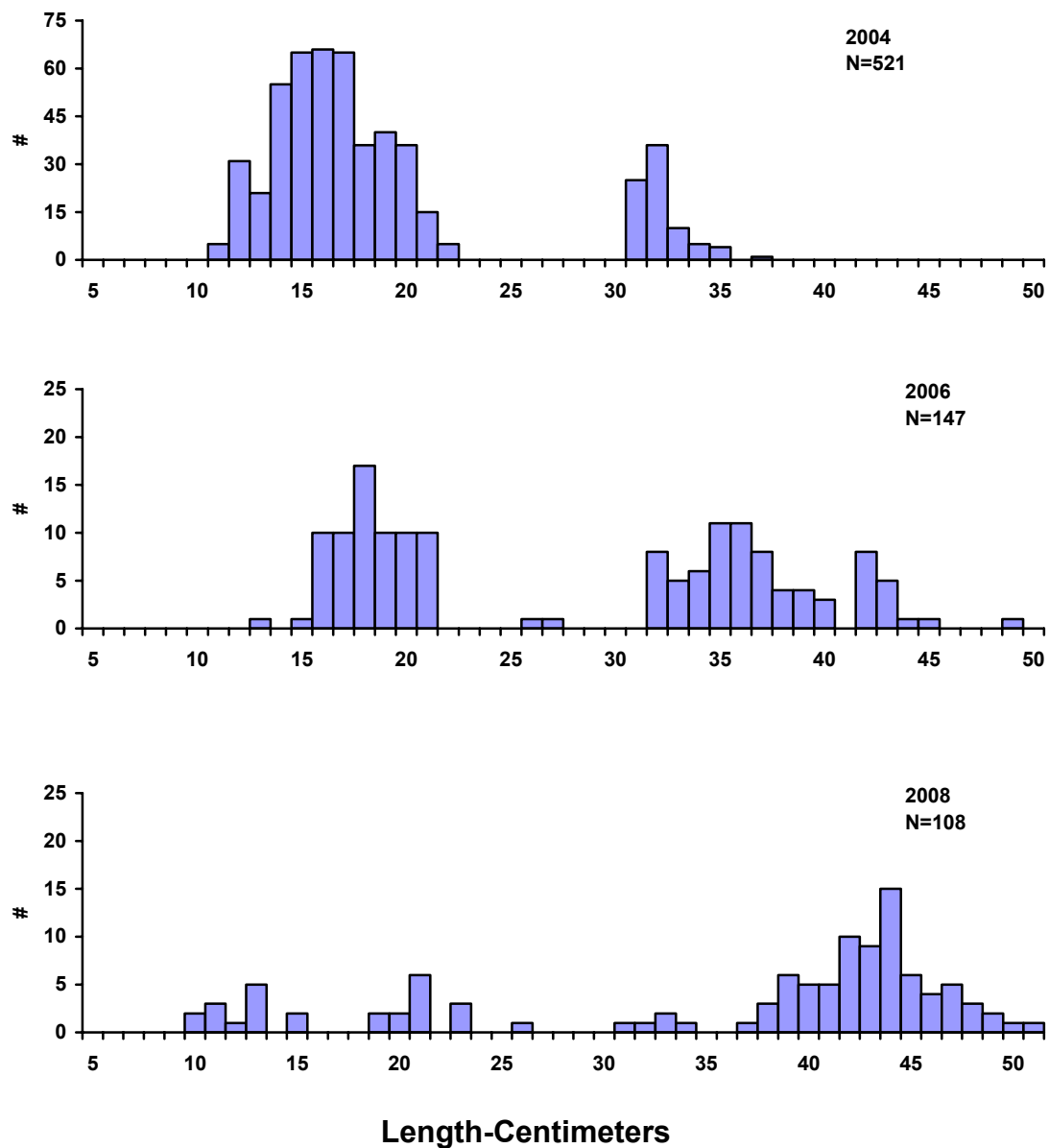


Figure 1. Length frequency histograms of largemouth bass sampled by electrofishing from Lake Lakota, Lincoln County, 2004, 2006, and 2008.

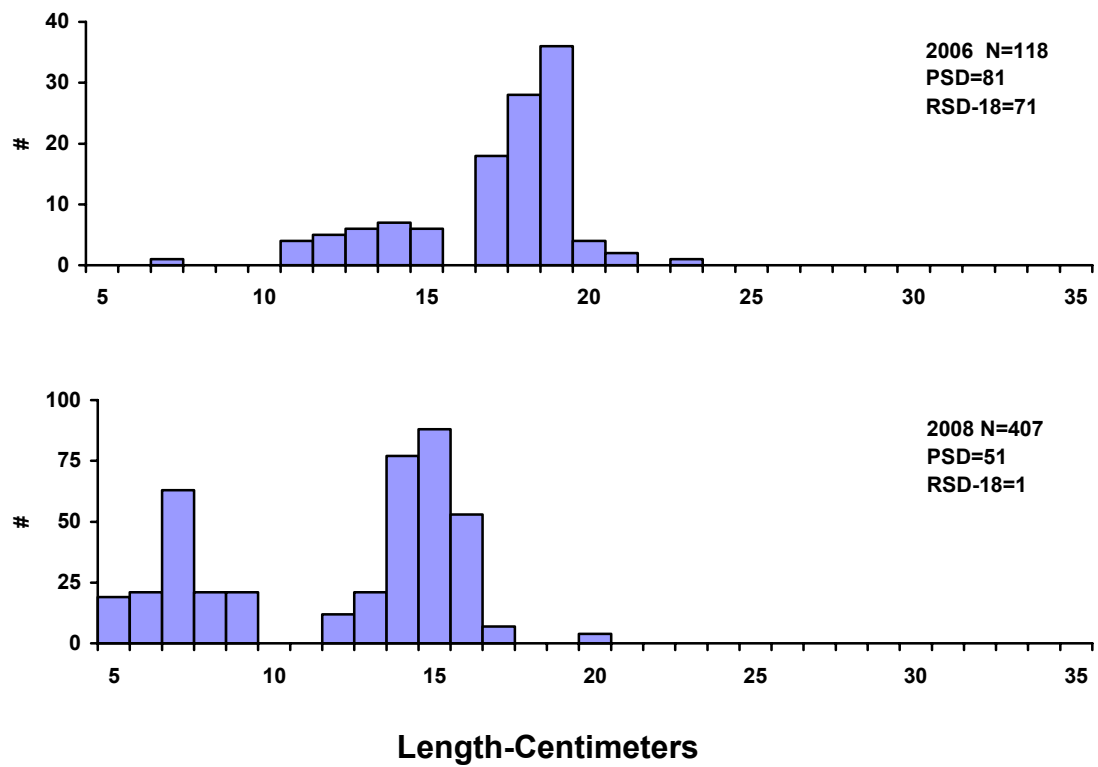


Figure 2. Length frequency histograms of bluegills sampled by electrofishing from Lake Lakota, Lincoln County, 2006, and 2008.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.